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MAY 00

**STUDENT HANDOUT**

**TACTICAL QUIET GENERATOR**

**CHARACTERISTICS AND INSTRUMENTATION**

**1. LEARNING OBJECTIVES:**

**a. Terminal Learning Objective:**

(1) Provided a generator set, mechanic's toolbox, and the reference, operate the generator set, so that it will apply voltage to appropriate equipment per the reference. (1141.02.02)

(2) Provided a schematic, a faulty generator set electrical system, and applicable tools and test equipment, with the aid of references, repair the generator set electrical system so that it functions properly in accordance with the appropriate equipment technical manual. (1142.01.03)

**b. Enabling Learning Objective's:**

(1) Provided a list of Tactical Quiet Generators and a selection of generator characteristics, identify the correct characteristic for each generator, in accordance with the applicable Technical Manual. (1141.02.02r) (1142.01.03au)

(2) Provided a list of Tactical Quiet Generator instruments and a selection of instrument functions, without the aid of reference, identify the correct function for each instrument, in accordance with the TM-09249A/09246A. (1141.02.02s) (1142.01.03av)

**BODY:**

**1. Characteristics of Tactical Quiet Generators:**

**a. MEP-803:**

(1) The MEP 803 is a 10,000 watt (10KW) generator producing 60Hz electric power. This generator is driven by a four cylinder water cooled Diesel Engine.

(2) The output voltages for this unit are 120 VAC single phase, 120/240 VAC single phase, and 120/208 VAC three phase.

b. MEP-813: The MEP 813 is an exact replica of the MEP-803 except that it is a unit that produces 400 Hz electric power.

c. MEP-805:

(1) The MEP 805 is a 30,000 watt (30KW) generator producing 50/60Hz precise electric power. This generator is driven by a four cylinder turbo charged engine with a fuel metering injector pump controlled by an electronic actuator.

(2) The output voltages for this unit are 120/208 VAC on low wye and 240/416 VAC on high wye.

(3) This unit has a malfunction indicator panel which indicates when an operational fault has occurred.

d. MEP-815:

(1) The MEP 815 is an exact replica of the MEP-805 except that it is a unit that produces 400Hz electric power.

e. MEP-806:

(1) The MEP 806 is a 60,000 watt (60KW) generator producing 50/60 Hz precise electric power. This generator is driven by a six cylinder turbo charged engine with a fuel metering injector pump controlled by an electronic actuator.

(2) The output voltages for this unit are 120/208 VAC on low wye and 240/416 VAC on high wye.

f. MEP-816:

(1) The MEP 816 is an exact replica of the MEP-806 except that it is a unit that produces 400 Hz electric power.

## 2. Control Panel Instruments of the Tactical Quiet Generator.

The control panel contains the various controls and instruments that provide the operator with sufficient information to ensure proper operation of the generator set. The control panel is the same for all Tactical Quiet Generator Sets.

a. Fuel Level Indicator. Indicates the level of fuel in the main fuel tank.

b. Panel Lights. The panel lights illuminate the control panel.

c. Coolant Temperature Indicator. Indicates engine coolant temperature (normal operation range is 170°F- 200°F)

d. Ether Switch. The ether switch activates or deactivates the cold weather starting aid system.

e. Panel Light Switch. Activates or deactivates the panel lights.

f. Frequency Meter (Hertz). Indicates generator set output frequency.

g. Ammeter (Percent Rated Current). Indicates generator set load current as a percentage of rated current.

h. AM-VM Transfer Switch. Allows selection of current and voltage readings between output load terminals as follows

<u>Switch Position</u>	<u>Voltage</u>		<u>Current</u>
	<u>Low Wye</u>	<u>High Wye</u>	
L1 - L0	120v	240v	L1
L2 - L0	120v	240v	L2
L3 - L0	120v	240v	L3
L1 - L2	208v	416v	None
L2 - L3	208v	416v	None
L1 - L3	208v	416v	None

i. Kilowatt meter (Percent Power). Indicates generator set output power as a percent of rated power.

j. AC Voltmeter (Volts AC). Indicates output voltage of the generator set.

k. Battle Short Switch. Bypasses all protective devices except for short circuit.

l. Battle Short Light. Amber light that indicates the battle short is activated.

m. Voltage Adjust Potentiometer. Adjusts generator set voltage.

n. Synchronizing Lights. Indicates synchronization of units to be paralleled.

o. AC Circuit Interrupter Switch. Opens and closes AC circuit interrupter relay. This switch serves the same purpose as the load contactor switch on the MIL-STD generator set.

p. AC Interrupter Light. Green light indicates AC circuit interrupter is closed.

q. Frequency Adjust Potentiometer. Adjust the frequency of the 30 kw and 60 kw generator sets only.

r. Emergency Stop Push-button. Shuts down the generator set in emergency situations only.

s. Parallel Unit Switch. Energizes or de-energizes paralleling circuits in the 30 kw and 60 kw generator sets only.

t. Master Switch.

(1) OFF - De-energizes all circuits in the control cubicle except for the panel lights.

(2) PRIME & RUN AUX FUEL - Energizes generator set run circuits with the auxiliary fuel pumps operating.

(3) PRIME & RUN - Energizes generator set run circuits with auxiliary fuel system de-energized.

(4) START - Energizes the starter circuits.

(5) Oil Pressure Indicator. Indicates the oil pressure (normal 25 - 60 psi).

(6) Time Meter (Total Hours). Indicates total hours of time that the generator set has been in operation.

(7) Battery Charge Ammeter. Indicates charge/discharge rate of batteries.

(8) Battery Charger Fuse. Located on the controls bracket assembly and protects the battery charging alternator from overload.

(9) Reactive Current Adjust Rheostat. Located on the control bracket assembly, it adjusts the current for load sharing requirements, while generator set is in parallel operation. **(Applies to the 30kw and 60kw generator sets only).**

(10) Load Sharing Adjust Rheostat. Located on the controls bracket assembly, it adjusts the power for load sharing requirements while generator set is in parallel operations. **(Applies to the 30kw and 60kw generator sets only).**

(11) Over-speed Reset Switch. Located on the controls bracket assembly, it resets the generator set after an over-speed condition has occurred.

(12) Frequency Selector Switch. Located on the controls bracket assembly, it allows the selection of 50 Hz or 60 Hz. **(Applies to MEP-805 and MEP-806 generator sets only).**

(13) DC Manual Power Circuit Breaker. Located on the controls bracket assembly, it energizes or de-energizes the DC circuits. It also protects the DC circuits from possible short circuits.

(14) Manual Speed Control. Applies to the MEP-803/813 generator sets only and permits engine speed adjustments through the

actions of a utility governor. Adjustments to the speed are made by depressing the button and pulling out or pushing in the control. Fine adjustments are made by rotating the venire knob. The frequency of the unit increases as the speed of the engine increases.

(15) NATO Slave Receptacle. The slave receptacle is located on the right front of the generator set and is used to jump start the generator or for remote battery operations. **(On the MEP-803/813 it is located on the right side).**

(16) Paralleling Receptacle. The paralleling receptacle is located to the left of the control panel. It is used to connect the paralleling cable between two generators of the same size and mode to operate in parallel.

(17) Convenience Receptacle. The convenience receptacle is located to the left side of the control panel. It operates any small plug-in type equipment requiring 120 VAC/15 Amps.

(18) Diagnostic Connector. The diagnostic connector is located to the left side of the control panel. It is a multi-pin plug that is wired to specific points in the generator set's electrical system. This enables monitoring and troubleshooting of the generator set operation.

3. **Fault Indicator Panel**: The malfunction indicator panel is located to the left of the control panel assembly and indicates malfunctions of the generator set components.

a. Low Oil Pressure Indicator. Illuminates when engine lubrication system's pressure is less than  $15 \pm 3$  psi during operation.

b. No Fuel Indicator. Illuminates when fuel level in the fuel tank is below preset level (approximately 4 minutes of fuel remaining in the fuel system).

c. Coolant High Temperature Indicator. Illuminates if engine coolant exceeds  $225 \pm 5$  degF.

d. Over voltage Indicator. Illuminates when voltage in 120 volt generator coil exceeds  $153 \pm 3$  VAC.

e. Over speed Indicator. Illuminates if engine speed exceeds  $2200 \pm 40$  rpm.

f. Reverse Power Indicator. Illuminates when reverse power exceeds  $20 \pm 3$  percent of the rated load.

g. Overload Indicator. Illuminates when the load on any phase reaches 130 percent of the rated load and the overload protective device activates.

h. Ground Fault Circuit Interrupter Test Button. Tests ground fault circuit interrupter.

i. Ground Fault Circuit Interrupter Reset Button. Resets the ground fault circuit interrupter.

j. Ground Fault Circuit Interrupter. Indicates that a ground fault condition has occurred in the convenience receptacle. If a red bar is not present, a ground fault condition has occurred in the convenience receptacle.

k. Short Circuit Indicator. Illuminates when generator set output in any phase exceeds  $425 \pm 25$  percent of the rated current.

l. Under volt. Illuminates when voltage drops below  $99 \pm 4$  VAC in any 120 volt generator coil winding.

m. Push Test/Reset Lamps. Test and resets fault indicator lamps.

**REFERENCES:** TM 09244A/09245A  
TM 09247A/09248A  
TM 09249A/09246A